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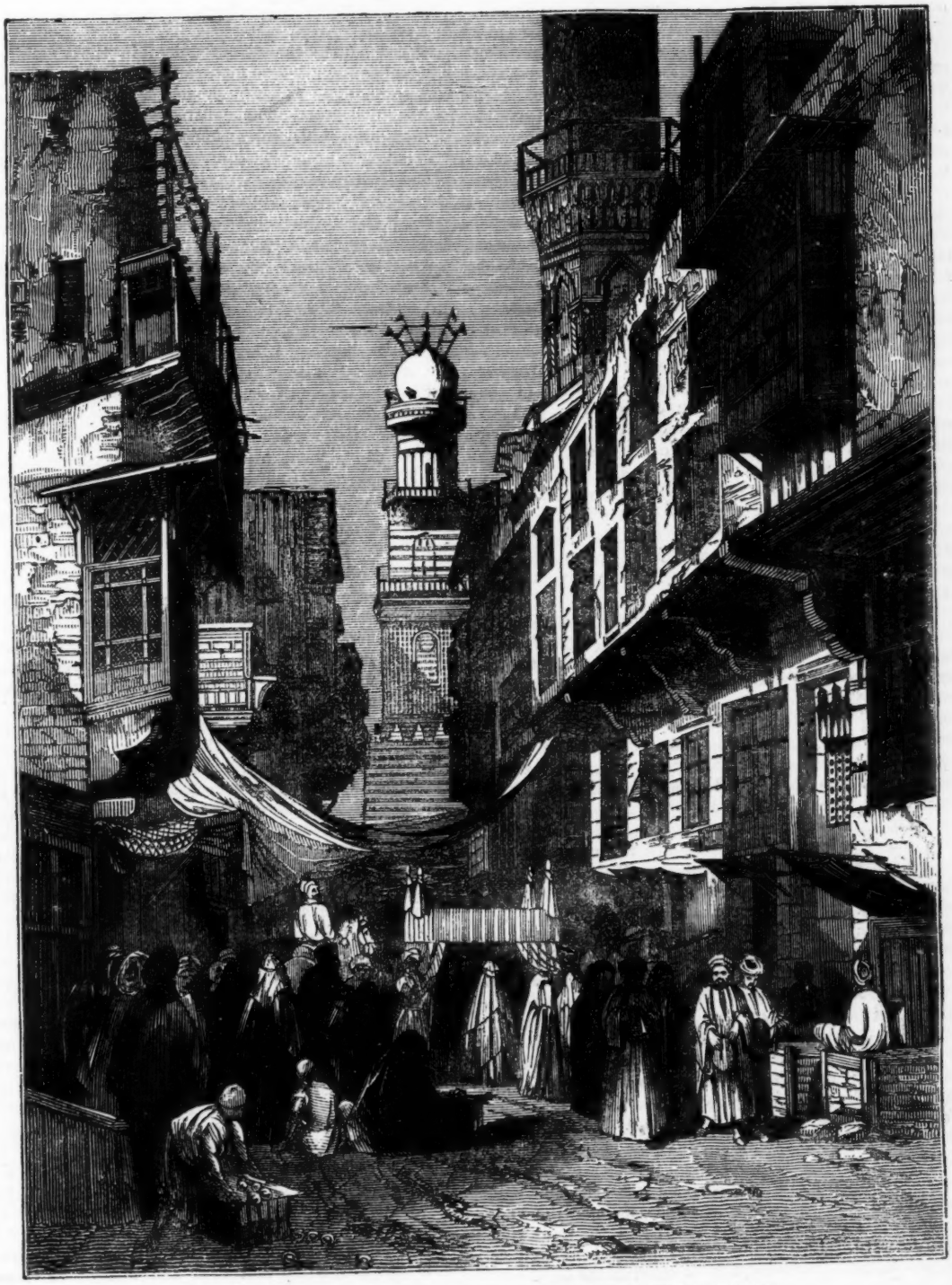
SKETCHES OF CAIRO. III.



BEYN-EL-KASREYN, WITH THE MINARET OF THE TOMB OF SULTAN KALAOON.

SKETCHES OF CAIRO.

III.

THE mosques of Cairo are numerous, and some of them so large as to occupy spaces three or four hundred feet square. They are mostly built of stone, the alternate courses of which are generally coloured externally red and white. A large mosque commonly consists of porticoes surrounding a square open court, in the centre of which is a tank or fountain for ablution. One side of the building faces the direction of Mekkeh, and the portico on this side, being the principal place of prayer, is more spacious than those on the three other sides of the court. It has generally two or more rows of columns, forming so many aisles parallel with the exterior wall. Sometimes this portico like the other three is open to the court; in some cases it is separated from the court by partitions of wood, connecting the front row of columns. In the centre of its exterior wall is a niche, which marks the direction of Mekkeh; and to the right of this is the pulpit. Opposite the niche there is generally a platform surrounded by a parapet and supported by two small columns; and by it, or before it, are one or two seats, having a kind of desk to bear a volume of the Ckooran, from which a chapter is read to the congregation. The walls are generally quite plain, being simply white-washed; but in some mosques the lower part o the wall of the place of prayer is lined with coloured marbles, and the other part ornamented with various devices executed in stucco, but mostly with texts of the Ckooran (which form long friezes, having a plea ing effect), and never with the representation of anything that has life. The pavement is covered with matting, and the rich and poor pray side by side, without any distinction as to rank; unless, (as is sometimes the case,) the rich man is attended by his servant, who brings a prayer-carpet and spreads it for his master. The prayer-carpet is about the size of our hearth-rugs, and has a niche represented upon it, the point of which is turned towards Mekkeh.

The Mooslim prepares himself for prayer by ablution. In every mosque there is a tank or reservoir for the supply of water; the person, therefore, having tucked up his sleeves a little higher than his elbows, says, in a low voice, "I purpose performing the woodoo (ablution) for prayer." He then washes his hands three times; and this, as well as every after ceremony, is accompanied by its peculiar prayer or ejaculation. He then rinses his mouth thrice, throwing the water into it with his right hand. Next, with his right hand, he throws water up his nostrils (snuffing it up at the same time), and then blows it out, compressing his nostrils with the thumb and finger of the left hand; and this also is done three times. He then washes his face three times, throwing up the water with both hands His right hand and arm, as high as the elbow, he next washes three times, and as many times causes some water to run along his arm from the palm of the hand to the elbow; he then repeats the same ceremony with the left hand and arm. He next draws his wetted right hand over the upper part of his head, raising his turban or cap with his left. If he have a beard, he then combs it with the wetted fingers of the right hand; holding his hand with the palm forwards, and passing the fingers through the hair from the throat upwards. He then puts the tips of his fore-fingers into his ears, and twists them round, passing his thumbs at the same time round the back of the ears from the bottom upwards. Next he wipes his neck with the back of the fingers of both hands, making the ends of his fingers meet behind his neck, and then drawing them forward. Lastly, he washes his feet as high as the ankles, and passes his fingers between the toes.

The woodoo, (says Mr. Lane), is generally performed in less than two minutes; most persons hurrying through the act, as well as omitting almost all the prayers, &c., which should accompany and follow the actions. It is not required before each of the five daily prayers, when the person is conscious of having avoided every kind of impurity since the last performance of this ablution. When water cannot be easily procured, or would be injurious to the health of the individual, he may perform the ablution with dust or sand. This ceremony is called *tey emmoom*. The person, in this case, strikes the palms of his hands upon any dry dust or sand (it will suffice to do so upon his cloth robe, as it must contain some dust), and, with both hands, wipes his face; then, having struck his hands again upon the dust, he wipes his right hand and arm as high as the elbow; and then, the left hand and arm, in the same manner. This completes the ceremony

Not only is cleanliness required in the worshipper, but also in the ground, mat, carpet, robe, or whatever else it be, upon which he prays. Persons of the lower orders often pray upon the bare ground, which is considered clean if it be dry; and they are in no hurry to wipe off the dust which adheres to the nose and forehead in prostration, for it is regarded as ornamental to the face; but when a person has a cloak or any other garment that he can conveniently take off, he spreads it upon the ground to serve as a prayer-carpet.

Prayer is required of the Mooslim five times in the course of every day. First, about four minutes after sun-set; secondly, when the evening has closed and it is quite dark; thirdly, at day-break; fourthly, at noon or a little later; and lastly, between noon and night. The Prophet would not allow his followers to pray at sun-rise, nor exactly at noon or sun-set, because, he said, infidels worshipped the sun at such times. The several times of prayer are announced by the mooeddin of each mosque from the minaret. Mr. Lane says, "Most of the mooeddins of Cairo have harmonious and sonorous voices, which they strain to the utmost pitch; yet there is a simple and solemn melody in their chants which is very striking, particularly in the stillness of night."

The devotions of the Mooslims, consisting as they do for the most part of a heartless repetition of words and idle ceremonies, have no permanent influence on the people generally; and are, indeed, felt to be a burdensome task, so that "there are comparatively few persons in Egypt who do not sometimes, or often, neglect this duty [of prayer]; and many who scarcely ever pray."

For the forms of prayer, and a minute description of the ceremonies, positions of the body, &c., which accompany their utterance, we refer to Mr. Lane's work. In the course of these ceremonies many ejaculations are repeated thirty-three times. These repetitions are counted on a string of beads ninety-nine in number, with a mark between each thirty-three. The beads are formed of aloes or other odoriferous or precious wood, or of coral, or of certain fruit-stones, or seeds, &c. In the "vain repetitions," varied ablutions, and other ceremonials of the Mooslim faith, we have an exact counterpart of the practice of the Pharisees of old so expressly condemned by our blessed Lord, as being the cleansing of the outside merely, while within was extortion and excess.

The Mooslim says the five daily prayers in his house or shop, or in the mosque, according as may be most convenient to him: it is seldom that a person goes from his house to the mosque to pray, except to join the congregation on Friday. Men of the lower orders oftener pray in the mosques than those who have a comfortable home, and a mat or carpet upon which to pray.

The same prayers are said by the congregation in the mosque on the noon of Friday, but there are additional rites performed by the Imam and other ministers on that occasion. The chief reasons for selecting Friday as the Mohammedan sabbath, were, it is said, because Adam was created on that day, and died on th same day of the week, and because the general resurrection was prophesied to happen on that day; whence Friday was named the day of El-Gom'ah, or the assembly. The

Mooslim does not abstain from worldly business on Friday except during the time of prayer.

The large mosques are open from day-break till nearly two hours after sun-set. The others are closed between the hours of morning and noon prayers; and most mosques are also closed in rainy weather (except at the times of prayer) lest persons who have no shoes should enter and soil the pavement and matting. Such persons always enter by the door nearest the tank or fountain that they may wash before they pass into the place of prayer; and generally this door is left open in dirty weather. The great mosque El-Azhar remains open all night, with the exception of the principal place of prayer, which is partitioned off from the rest of the building. In many of the larger mosques, particularly in the afternoon, persons are seen lounging, chatting together, eating, sleeping and sometimes spinning, or sewing, or engaged in some other simple craft; but Mr. Lane says that, notwithstanding such practices, the Mooslims very highly respect their mosques.

The other religious practices of the Mooslims consist in *alms-giving*, *fasting*, and *pilgrimage*. We will quote Mr. Lane's account of this last duty of the Mooslim.

It is incumbent on every Mooslim, to perform once in his life, the pilgrimage to Mekkeh and Mount Arafat, unless poverty or ill health prevent him; or, if a Hhanafee, he may send a deputy whose expenses he must pay. Many, however, neglect the duty of pilgrimage who cannot plead a lawful excuse, nor are they reproached for so doing. It is not by the visit to Mekkeh, and the performance of the ceremonies of circuiting the Kaabeh seven times, and kissing the "black stone" in each round, and other rites in the holy city, that the Mooslim acquires the title of *el-hhagg* or the pilgrim; the final object of the pilgrimage is Mount Arafat, six hours journey distant from Mekkeh. During his performance of the required ceremonies in Mekkeh, and also during his journey to Arafat and until his completion of the pilgrimage, the Mooslim wears a peculiar dress, called *ehhram*, generally consisting of two simple pieces of cotton, or linen, or woollen cloth, without seam or ornament, one of which is wrapped round the loins, and the other thrown over the shoulders; the instep and heel of each foot, and the head, must be bare; but umbrellas are now used by many of the pilgrims. It is necessary that the pilgrim be present on the occasion of a khootbeh which is recited on Mount Arafat in the afternoon of the 9th of the month of Zool-Hheggah. In the ensuing evening, after sunset, the pilgrims commence their return to Mekkeh. Halting the following day in the valley of Mina (or, as it is more commonly called, Moona), they complete the ceremonies of the pilgrimage by a sacrifice (of one or more male sheep, he-goats, cows, or she-camels, part of the flesh of which they eat, and part give to the poor,) and by shaving the head and clipping the nails. Every one after this resumes his usual dress, or puts on a new one, if provided with such. The sacrifice is called *el-fida* (or the ransom), as it is performed in commemoration of the ransom of Ismaeel (or Ishmael) by the sacrifice of the ram when he was himself about to have been offered up by his father: for it is the general opinion of the Mooslims that it was this son, not Isaac, who was to have been sacrificed by his father.

Our frontispiece (selected from one of the views in Mr. Hay's admirable work) represents the collegiate and sepulchral mosque adjoining the Muristan. Over its entrance is the following inscription:—

In the name of God, the compassionate, the merciful, the Sultan El'-Adil es Salehee, Mohammed, the son of the deceased Sultan Kalaoon (may God sanctify his soul!) founded this honoured Kubbeh (or dome-crowned building) in the months of the year 695 A.H. (A. D. 1295-6).

The Minaret (says Mr. Hay) is partly coloured with broad alternate stripes of red and white, so commonly adopted in Cairo, pleasing in the relief it gives to the eye from the glare of an ardent sun, and the monotony of colours in so arid a climate.

The Sultan Kalaoon is said to have been a skilful physician, and superstition preserves in the mosque several talismanic mementoes of his reputation: amongst them are two columns, the touch of one of which is believed to be a sure cure of jaundice.

The celebrated charitable foundation which adjoins this mosque is destined to receive weak and insane patients. It was founded by the Sultan Kalaoon, and bears the following inscription:—

Our Lord the most great Sultan, el-Melik el-Mansoor Seyf-ed-Deen Kalaoon, es-Salehee, commanded to found this noble venerated Kubbeh and blessed college and blessed Beemaristan; and the commencement of the construction thereof was in Rabeea-el-Akhir, in the year 683 (A. D. 1284); and the completion thereof in Gumada-'l-oola, in the year 684.

Part of the minaret of the Barkrookeveh is also represented. Three musicians with the zemr and tabl (hautboy and drum) precede a marriage procession; the female friends and relations of the bride follow, amongst whom the virgins are distinguished by their white dresses. The bride, supported by four others of her relations, is beneath the canopy; the corners of which, on the top of the poles, are adorned by embroidered handkerchiefs.

MAPS AND MAPPING. II.

Modern Maps.—Projection of the Sphere.—Gnomonic.—Orthographic.

Modern Mapping is particularly distinguished by the accuracy with which the relative positions on the surface of the earth are marked, in consequence of the aid afforded to the subject by astronomical discovery. Attempts were at first made to determine the longitude of places, by observing the eclipses of the sun and moon; but this method proved, on experience, so likely to be attended with error, that astronomers were constrained to abandon it. Galileo, by the discovery of the satellites of Jupiter, in 1610, introduced a more certain method, which was rendered available by means of the simultaneous observations of Picard and Cassini, at the observatories of Uraniburg (in Denmark) and Paris.

These experiments were made in the latter part of the seventeenth century; and, in consequence of their success, MM. Picard and De la Hire were employed to examine and to correct the map of France by astronomical observations. In executing this task, they were obliged to contract France within much narrower boundaries than it was supposed, according to the maps of that time, to occupy. They reduced it above one degree of longitude along the western coast from Brittany to the Bay of Biscay; and, in the same manner, they cut away about half a degree from the shores of Languedoc and Provence. These changes gave rise to a jest of Louis the Fourteenth, who, when complimenting the astronomers at the completion of their task, told them "he was sorry to observe that their journey had cost him a large portion of his kingdom."

But the map-makers of the times, with an inveterate attachment to the notions and methods of their predecessors, were tardy in taking to their service the astronomical observations which were multiplied round them every day. The map of the Mediterranean was not adjusted until the year 1720; and it was then done in consequence of Chazelles being sent to the Levant, to ascertain the difference in longitude between the shores of Palestine and the meridian of Paris.

William Delisle and J. B. d'Anville, by eschewing the errors of the ancients and adopting the light of modern science, brought the state of mapping to a greater perfection than it had heretofore obtained. While the French were thus engaged, at the beginning of the eighteenth century, the English laboured to the same end by means of Halley and Newton. As the process of map-making now began to attain the comparative completeness of recent times, we need not dwell further on this part of our subject, than to observe that, notwithstanding the advanced state of our astronomical and geographical knowledge, and the science and skill displayed in our great national and other surveys, we

must still regard maps as works in progress,—always unfinished, and still waiting the corrections to be supplied by the science and enterprise of succeeding ages.

We shall endeavour now to describe in a clear, but concise, manner, the fundamental principles which have been employed at various times and on various occasions for the production of maps, or scientific pictures of the earth's surface. The reader, being doubtless acquainted with the form of the earth, will see at once that the main object to be achieved is, to represent on a plane, or flat, surface that which is actually round, or spherical. The smaller the portion of the earth's surface to be represented, the more easily may this be done; but the nearer we approach to a hemisphere of the earth, the more difficult is this object to be accomplished, without distortion of some of the parts. All the methods used with this view are but approximations to correctness, as we shall presently explain.

From the spherical form of the earth, the divisions and varieties of its surface may be most simply and most accurately represented by means of a globe; and, in order to obtain a correct notion of its general geographical features, there is no mode of representation so satisfactory. Large globes are, however, expensive and inconvenient instruments; and small ones, by not admitting sufficient detail, are, for most geographic purposes, entirely useless. For instance,—with a scale which would make the map of England extend only about six inches from north to south,—thus giving one degree of latitude to an inch,—the diameter of a globe, on which the whole surface of the earth should be delineated, would be upwards of 9½ feet! In this representation we must also omit all the minute divisions of the countries of the earth, together with a vast body of geographical and statistical distinctions, invaluable to geography as a science.

We not only have *terrestrial* maps, which aim at representing the convex surface of the *earth*, but *celestial* or astronomical maps, are made to represent the (apparent) concave surface of the *heavens*.

Of terrestrial maps there are two sorts,—*geographic*, or land-maps; and *hydrographic*, or sea-maps: the former are specially styled "MAPS,"—the latter are usually denominated "Charts."

Geographical maps are *universal* or *particular;* the former representing the two hemispheres of the world,—the latter containing only particular portions of the globe. When maps give the nature of the *ground*, the roads, buildings, &c., in detail, they become *topographic* maps, which, necessarily embracing a very small extent of country, are not usually referred to any spherical projection, but are represented as geometric planes, the objects in them occupying the positions severally assigned to them by the trigonometrical operations of the survey. The same distinction is made in charts of small bays and harbours. In either of these cases they are often called "Plans." Maps which are intended merely to illustrate some of the sciences, bear their own peculiar names; as geological, mineralogical, or botanical maps.

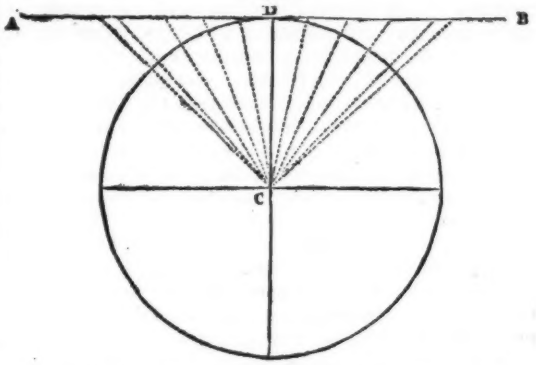
The various methods adopted by geographers in the construction of maps, may be referred to two principles,—PROJECTION and DEVELOPMENT.

The term "Projection," implies a *throwing forward*, or *laying down in front:* it is used to express generally the representation of the surface of a sphere according to the rules of perspective.

I. Of projection as referring to the first principle, there are four sorts in common use;—the Gnomonic or Central,—the Orthographic,—the Stereographic,—and the Globular: all these are distinguished from each other by the different positions of the projecting point in which the eye is supposed to be placed.

1. In the Gnomonic or CENTRAL Projection, the eye is supposed to be placed in the *centre* of the sphere, as at C; and the various objects to be delineated are transferred from the sphere to the plane A B, which is a tangent to its surface at D, where the rays are direct. It

Fig. 1.



is termed *gnomonic*, because of the connexion between the methods of laying down this projection and those for the construction of a *gnomon*, or sun-dial. The gnomon, or style of a dial, is the plate which projects from the surface of the dial-plate, the edge of its shadow determining the hour-line.

A slight consideration of this sort of projection makes it manifest to us that it is most profitably employed in astronomical maps; portions only of the concave sphere of the heavens being afforded at one view, as may be observed by reference to the preceding diagram; where it is evident that five or six *plane*-maps would be required to lay down the concave surface of the sphere whose centre is C. It will be observed also that an entire hemisphere cannot be thrown upon the plane A B.

In this projection, all the *great* circles of the sphere,—that is, all such as have their centres coinciding with the centre of the earth,—appear as straight lines; which property belongs to no other projection.

Though this projection may be advantageously applied to any maps of a limited extent, yet it is more particularly useful in maps of the polar regions of the globe. In this case, the meridians will be straight lines radiating from the centre, and the parallels of latitude concentric circles. Other cases of this projection, in respect of terrestrial maps, are seldom brought into use, because the construction is rendered troublesome, on account of the parallels of latitude becoming curves of difficult delineation.

2. The ORTHOGRAPHIC projection is so named, because the *delineation* is completed, as it were, by *right* lines. In this projection the eye is supposed to be at an infinite distance off; so that the visual rays leave the sphere in parallel lines. The perspective plane, on which a hemisphere is supposed to be delineated, is, therefore, at right angles to the visual rays;—hence, every point of the hemisphere is transferred to this plane by perpendiculars let fall upon it. It will be seen at once from the annexed figure, that the representation will decrease in accuracy with the increase of distance from the centre; the parts near the circumference being much foreshortened and distorted. For instance,—although the points A B C D are equidistant, their representatives *a b c* D are very unequally disposed.

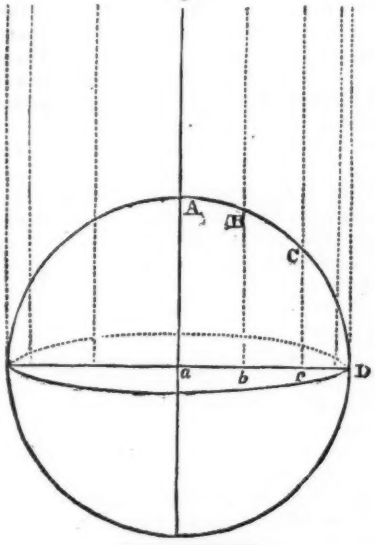
By this projection the surface of a hemisphere is reduced to that of a great circle of the sphere, or only half its hemispherical area; and, consequently, all parts of that surface are contracted, while equal parts of the spherical surface are not reduced to equal spaces on the map. On account, therefore, of the excessive contraction on approaching the extremities, this projection, though it is occasionally used for astronomical purposes, is almost exploded in the construction of geographical maps.

The orthographic projection of any object,—the terrestrial globe for example,—with all its circles, and the continents and islands on it surface, is *nearly* the representation or picture which an artist would delineate on a plane surface, if he meant to represent the globe at a considerable distance from the eye; and it is *exactly* the appearance which the globe would have, supposing an eye could view it at an infinite distance off.

In a polar map of this projection,—that is, a map which has one of the poles for its centre,—the meridians, as in the polar gnomonic maps, will be radii, and the parallels concentric circles. In an equatorial map, or one in which the equatorial regions of the globe are made to occupy the centre of the map, the plane of projection coincides with the plane of one of the meridians. In this case, the latitude-circles will form straight lines parallel with the equator, which will be also a straight line: the meridians will form portions of ellipses.

We shall notice the principles employed in the other modes of projection, in our next and concluding paper.

Fig. 2.



CHINA. XII.

The Island of Chusan—Military Occupation—Houses and Offices of the Chinese.

The extreme jealousy with which the authorities of the *Celestial Empire* are accustomed to regard all foreigners, enhances the value of any authentic information which may be obtained respecting a people, of whom the little we know only adds to our desire of a more thorough knowledge. Valuable, indeed, to the political economist would be an authentic statement of the statistics of an empire which in many things differs so widely from all the kingdoms of Europe; a country where civilization and literature seem to have advanced to a certain extent, and then for ages to have remained stationary; a country more densely peopled than any other part of the world, and yet where all emigration is so much discouraged, that, to use an expression of their own, "when a Chinaman leaves the flowery land to wander in countries beyond the sea, he rarely, if ever, is permitted to return to his native land;" a country which, notwithstanding its vast extent of territory and immense population, has for so many centuries been the seat of a permanent government more exempt from revolution than any other in the world. Various writers, indeed, have presented us with their accounts of China, but those which enter most into detail seem obnoxious to the remark of Lord Jocelyn, that their "lengthened labours require an appetite for the marvellous to digest. Dates and exact statements of finance &c.," continues he, "are difficult to be correctly obtained in any country, but more particularly in these far eastern lands; and it is not probable that a jealous race like the Chinese would permit a stranger to become very intimately acquainted with their internal policy. Errors may have arisen not from any intentional mis-statement, but from a guileless disposition, giving too easy a credence to the natives of the country."

We have been careful in the information with which, from time to time, we have furnished our readers, to confine ourselves to such subjects as might fall under the observation of Europeans, and to draw from none but authentic sources; we now proceed to make a few extracts from the *Personal Narrative* lately published by Lord Jocelyn, who acted for some months in the capacity of Military Secretary to the China mission, but was compelled by severe illness to return home. Passing over the capture of the island of Chusan, we will accompany the conquerors into the city of Tinghai:—

"A few of the staff entered the town, accompanied by an interpreter, to quiet the fears of the inhabitants, whilst the troops remained in position on the outer side of the fosse. The main street was nearly deserted, except here and there, where the frightened people were performing the kow-tow* as we passed. On most of the houses was placarded 'Spare our lives;' and on entering the jos-houses were seen men, women, and children, upon their knees, burning incense to the gods; and although protection was promised them, their dread appeared in no manner relieved. Many were posting down the back lanes into the country with their spoil, for we afterwards found the goods principally carried away were taken by plundering natives, not by the legitimate owners.

"At last we came to the house of the Chumpin (Admiral): the gates leading to the entrance-yard were painted with huge ungainly figures, denoting, they said, Justice and Punishment. On one side was the Room of Justice, and thumb-screws and rattans were seen lying about. The path to the inner apartment, called the Hall of Ancestors, lay through an open court, round which were the offices of the government clerks. Some letters and papers half-finished showed the haste with which the town had been evacuated. Passing through the court we entered a guard-house, which led again to a trelliced walk, at the south end of which was the hall. Here on the couches were the pipes half-smoked, and the little cups filled with the untasted tea; cloaks, mandarin's caps, and swords lay about in confusion. Following up our research we at last came to the apartments of the ladies: these rooms were curiously furnished, and strewed with clothes of all descriptions and for all purposes. Silks, fans, china, little shoes, crutches, and paint-pots—the articles of a Chinese lady's toilette—lay tossed in a sad and tell-tale *mêlée*, and many of these fairy shoes were appropriated by us as lawful *loot*†.

"The town of Tinghai, or Tinghai-een, covers a large space of ground at the mouth of a valley or rather gorge; the neighbouring hills are clothed with wild shrubs, of which the tea-plant is the most predominant. The city lies embosomed in luxuriant paddy, except towards the rear, where a beautiful hill commands the whole town, dotted with clumps of fine trees, part of it being included within the wall and the fortifications that encircle the town. Two paved roads lead down to the suburbs on the shore, a distance of about three-quarters of a mile, flanked on the left by the Jos-house hill. The buildings in and near seem to consist of large warehouses belonging to the merchants of the town, and are very convenient for shipping and landing their cargoes. Tinghai is surrounded by a wall, about sixteen feet in thickness and twenty in height: there are four gates, agreeing with the cardinal points of the compass, traversed much in the

* A salute practised by an inferior to his superior, kneeling and striking the head upon the ground.

† A Bengalee word for plunder—at which, by the bye, they are peculiar adepts.

form of Marhattah forts, the principal one being on the southern point facing the sea. The wall is surrounded by a canal, which acts as a ditch to the fortification, except at the north-west angle. Two powder-magazines were found neatly packed and filled with ammunition, and with implements for the manufacture of powder: on the walls were mounted gingalls and cannon of various calibres, but none exceeding a nine-pounder; and wall-pieces with shifting breeches, each having eight or nine spare breeches attached to it, ready loaded. The streets are narrow, and many of the houses dry-rubbed, and polished outside; but the roofs are the most picturesque part of the buildings. Many of the respectable houses have pretty gardens attached to them, with a high wall shutting them out entirely from the town. The interiors of some of the houses were found beautifully furnished and carved: one that is now inhabited by the Governor, and believed to have been the property of a literary character, was, when first opened, the wonder and admiration of all. The different apartments open round the centre court, which is neatly tiled; the doors, window-frames, and pillars that support the pent roof, are carved in the most chaste and delicate style, and the interior of the ceiling and wainscot lined with fretwork, which it must have required the greatest nicety and care to have executed. The furniture was in the same keeping, denoting a degree of taste the Chinese have not in general credit for with us. The bed places in the sleeping apartments of the ladies were large dormitories, for they can hardly be called beds: at one corner of the room is a separate chamber, about eight feet square, and the same in height; the exterior of this is usually painted red, carved, and gilt; the entrance is through a circular aperture, three feet in diameter, with sliding pannels; in the interior is a couch of large proportions, covered with a soft mat and thick curtains of mandarin silk: the inside of the bed is polished and painted, and a little chair and table are the remaining furniture of this dormitory.

"Many of the public buildings excited great astonishment among those who fancied they were in a half barbarous country. The public arsenals were found stocked with weapons of every description, placed with the greatest neatness and regularity in their different compartments: the clothes for the soldiers were likewise ticketed, labelled, and packed in large presses, and the arrows, which from their size and strength drew particular attention, were carefully and separately arranged. To each arsenal is attached a fire-engine, similar to those used in our own country.

"The government pawnbroker's shop was also a source of interest: in it were found dresses and articles of every kind, evidently things belonging to the upper as well as the lower classes, for many of the furs here taken were of valuable descriptions: each article had the owner's name attached, and the date of its being pawned: this is one of the plans of the local government for raising their supplies. In the treasury there was a sad deficit for the prize-agents, no bullion being discovered in the chests: this, however, had been evidently cleared out by the government servants.

"The town is intersected with canals, which run at the back of many of the principal streets, thereby enabling the inhabitants to take their goods without trouble from their own doors to any part of the city, and thus communicate with the suburbs and port with the greatest facility, by the water-gate.

"Some of the joss houses, in this place, from what we have seen and heard from others, are to be surpassed by none in China. In Lord Macartney's mission, the one at Macao is mentioned as the finest specimen they saw in the whole tour, but all those who have visited the principal ones at Tinghai agree in their great superiority over it. In the great temple some of the figures in the principal hall are upwards of fifteen feet high, handsomely wrought, standing in the centre on a lofty pedestal, while around the walls are small images of the same description in all sorts of grotesque attitudes. We were particularly struck by one, the figure of a woman, with a child apparently issuing from her breast, and a glory round her head. It seems difficult to say from what this has arisen, unless from the pictures of the Virgin, which the Chinese formerly obtained from the Jesuit missionaries, and have thus distorted. A white elephant was likewise a great subject of discussion, being hitherto known only as a figure of worship in Birmah and Siam.

"Very few women were found in any of the houses, although, as it afterwards appeared, whole families of Chinese were then residing in the town, locked up in their dwellings, and were not discovered until the ulterior occupation of the city by the troops for winter quarters. All the women we saw here had the little feet which to the south is generally the appendage of the higher orders, and made use of a crutch when walking. Many of the silks taken in the houses of mandarins and people of wealth were of the finest textures, and covered with magnificent embroideries.

"Since I have seen many of the houses and temples of the Chinese, the paintings on the old china imported into England have struck me as the best delineation of the buildings and figures of these extraordinary people, and it is wonderful how correct they are in the main features."

HE who contends for truths which he has himself been permitted to discover, may well sustain the conflict in which presumption and error are destined to fall. The public tribunal may neither be sufficiently pure nor enlightened to decide upon the issue, but he can appeal to posterity, and reckon with confidence on "its sure decree."—SIR DAVID BREWSTER.

ON CHESS. No. XVII.

THE AUTOMATON CHESS-PLAYER. 5.

THE explanation which has been given of the Chess Automaton is admitted to be correct in all its details, except as regards the means employed by the concealed player to gain a knowledge of the moves of his antagonist and to make his own. This information belongs, however, to those minor details which could only be obtained by actual inspection of the interior arrangements of the machine:—we can scarcely admire too highly the sagacity of Mr. Willis, who, enjoying no advantages of inspection beyond those given to the spectators in general, succeeded, nevertheless, in discovering the secret of this famous machine, and demonstrating, by means of drawings and clear descriptions, the presence and position of the *animal power* which worked the automaton.

Mr. Willis imagined that the concealed player obtained a view of the chess-board by looking through the waistcoat of the figure, so that his head was separated from the spectators only by a thin veil. The objections to this theory are numerous: among the many eyes and ears, sharpened as they were by anxious curiosity, something would surely be seen or heard to lead to discovery,—the smallest motion or sound,—even the simple act of respiration in that confined situation, might detect the confederate. It is evident that de Kempelen foresaw all this, and was thus led to provide the ingenious means we are about to describe, as being the more secret and effectual for carrying on the game.

It is proper to state that M. Mouret himself, so long the secret colleague of M. Maelzel, furnished an account of the mysteries of the automaton, from which M. de Tournay, a member of the Paris Chess Club, has published his account in the first volume of *Le Palamède*, a French periodical, devoted chiefly to Chess. It is from this source that we have derived the following information, which may, therefore, in every respect, be considered authentic.

We stated in a former article, that, during the exposure of the interior mechanism, the exhibitor held a lighted candle to several parts of the machinery, and that he left his candle burning on an adjoining slab: the reason for this was to prevent any notice being taken of a wax taper in the interior of the machine, should its rays chance to flash out during the exhibition. The wax taper furnished the concealed player with light; and he was supplied with air by certain openings which did not appear, and by others which appeared necessary to the construction of the outer chest, or to the trunk of the Turk.

Within reach of the concealed player were, *first*, a handle by which he could guide the arm of the automaton; *secondly*, an elastic spring for moving its fingers; and, *thirdly*, a cord in communication with bellows for producing a sound to imitate "Check*." The principal contrivance requiring explanation is, that by which the player was made acquainted with the moves on the automaton chess-board, and thus enabled to repeat them on a smaller chess-board of his own. The concealed player is seated in that part of the chest immediately under the automaton's chess-board, and may be supposed to be looking up to the roof of his narrow cell. There, on what may be called his ceiling, he sees a representation of that chess-board, each square painted to correspond with the square above; the only difference being, that, in the automaton's board, some of the squares are occupied by chess-men and the rest are empty, while, in the board beneath, every one of the squares is numbered and furnished with a small metallic knob. Every chess-man on the automaton's board contains a small magnet, and each move made with any one sets in motion the metallic knob belonging to the squares from and to which such piece is played.

To illustrate this action more clearly, let the reader suppose himself placed under a table both surfaces of which are respectively divided into sixty-four corresponding squares: to each square of the under-side of the table is suspended by means of a very short thread a little iron ball. Now, as a magnet exerts its attractive force for unmagnetised iron and steel through any known substance, (except, of course, through iron and steel,) it is quite clear that the wood of the table will not prevent the magnets contained within the chessmen from attracting the little balls, and holding them, as it were, fixed to the under surface of the table: but, as there are only thirty-two chessmen actually on the board at the commencement of the game, it follows that thirty-two balls are attached to the wood of the table, while the other thirty-two remain suspended by their threads. As soon as one particular piece is taken up for the purpose of making a move it is obvious that the metallic knob immediately below it, being no longer subject to the magnetic attraction, falls as far as it is permitted by the length of the thread which supports it, and thus intimates to the person below that the square just occupied by a piece is now vacant;—but the piece being placed on another square, the knob below that square starts up and thus indicates the precise square to which the piece was played. The concealed player repeats the move on a little board, with which he is furnished, and which is numbered to correspond with the board on the underside of the table; this board is constructed in the manner of the chess-boards used in travelling so as to be safe from the danger of having the pieces upset. On this board he also makes his own move, and takes note of the numbers of the squares from and to which his piece is played;—he then sets the arm of the automaton in motion,—takes up the piece he designs to play,—the little knob falls down;—he plays the piece to the square intended, and the little knob rises up;—and thus the game proceeds.

* This last addition was made by M. de Kempelen, previous to his second tour.

This illustration will afford the reader a more perfect notion than has yet been given of the mode of working the automaton. We have nothing more to say respecting the mechanical part of this strange deception, and therefore beg to conclude our notice with a translation of the latter half of M. de Tournay's very amusing article.

M. Maelzel having entered into an agreement with M. Mouret, a very eminent chess-player, to conduct the internal arrangements of the automaton, the two confederates set out on a tour for the purpose of spreading the fame of the automaton, and reaping the benefit of the deception in many towns of England, Scotland, and Holland, where it was yet only known by report. The most complete success attended this journey. Wherever they went, spectators crowded to the exhibition to witness the triumphs of the automaton, who always kept his ground against his antagonists, and came off victorious, in spite of the advantage which he permitted to his opponent in giving him the pawn and move.

The exhibitor and his assistant went on for some time in perfect harmony: accounts were settled between them at every halting-place, and each was perfectly satisfied. It happened, however, on one of these occasions that M. Maelzel remained debtor to his assistant for a considerable sum, and as weeks and months passed by he still had some pretext for omitting its payment. At length a year had passed, without producing the desired settlement, and M. Mouret, weary of this delay, found the means of frightening his companion into his proper duty.

The automaton was then at Amsterdam: the king of Holland sent one morning to engage the exhibition-room, at the same time ordering a sum equal to three thousand francs, to be paid to M. Maelzel. The latter went joyfully to announce the good news to his associate —they breakfasted together, and were delighted at the thought of entering the lists with a crowned head. M. Maelzel then hastened to make such preparations as should make the exhibition as brilliant as possible. The performance was to commence at half-past twelve at noon. Twelve o'clock arrives, and it is time for M. Mouret to take his station in the chest. But he has not yet arrived, and M. Maelzel hastens to find out the cause of the delay. What is his surprise to find Mouret in bed, and seized with a convulsive trembling. "What do I see? what is the matter?" exclaimed Maelzel. "I have a fever," said his artful assistant.—"Why, you were very well just now!"—"Yes, but this is a sudden attack."—"The king will be here presently."—"He must go back again."—But what can I say to him?"—"Tell him the automaton has got the fever."—"No more of this folly."—"I don't wish to joke with you."—"Then pray get up."—"Impossible."—"Let me call a physician."—"It is of no use."—"Is there no means of subduing this fever?"—"Yes, one only."—"What is it?"—"To pay me the 1500 francs you owe me."—"You shall have them ... this evening?"—"No, no, this moment."—M. Maelzel saw too plainly that there was no alternative, and went to fetch the money. The cure was wonderful; the automaton was never so attractive before. The King did not actually play, but he advised his Minister of War, who played for him. The pair were completely beaten by the automaton, but all the blame of the defeat was, of course, thrown upon the Minister.

Another anecdote is related of the automaton to the following effect. In one of the towns of Germany a conjuror had been exhibiting his various tricks, to the delight and amazement of the inhabitants, when the arrival of the automaton presented a still more powerful object of attraction, and left the poor fellow without an audience. Annoyed and jealous at the reputation of his rival, he went to be himself a witness of the new performance, and from his own experience in the art of deception he felt convinced that the chest contained a hidden player.

He therefore began all at once to raise a cry of "Fire," in which he was seconded by one or two companions. The spectators were seized with the greatest alarm, in which, strange to say, the automaton participated, and in his fright upset his adversary and tottered about as if he were mad. Happily, M. Maelzel, who preserved his presence of mind, was able to push him behind a curtain, where he soon became quiet, and recovered his usual dignified bearing. The alarm of fire was soon discovered to be false, and the conjuror did not gain anything by his attempt to undeceive the company. After this event M. Maelzel, in giving directions to a candidate for the office of concealed player, was accustomed to say, "If you hear a cry of fire, don't stir; I will come to your help."

The automaton was afterwards taken to North America, where it was exhibited, during several years, in the principal towns of the United States and Canada. South America then received a visit from this wonder of the age, and after a due exhibition of its powers the automaton finally sank into oblivion, and was deposited in a lumber-room at New York, where we believe it still remains, never again perhaps to be the means of exciting curiosity or interest.

THE WATER SCORPION.

(*Nepa linearis.*)

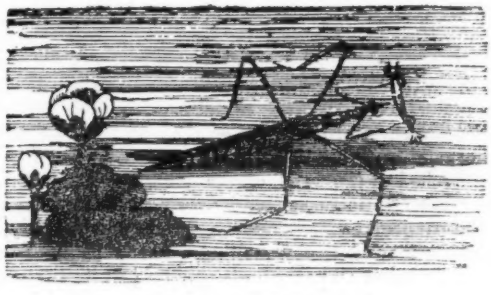
THE genus Nepa includes a family of aquatic hemipterous insects inhabiting stagnant waters, and preying on the smaller water insects, &c. The largest species yet known is *Nepa grandis*, a native of Surinam and other parts of South America. This species far exceeds all the European animals of that genus in size. It measures three inches in length. It lives in the water, in the larva and pupa state, and attacks not only other water insects but some animals much larger than itself. Madame Merian represents this species, among her Surinam insects, as preying upon tadpoles and young frogs. Its colour is a dull yellowish brown, with a few darker shades or variegations: the under wings are of a semitransparent white colour, and the abdomen is terminated by a short tubular process.

The term *Nepa* is supposed by some to have been originally a misprint from *Hepa*, a Latin word applied to the scorpion. The structure of the individuals of this family shows their rapacious character: they seize their prey by the assistance of their fore-legs and convey it to the mouth, which consists of a short, but acute and strongly articulated proboscis, with which they are enabled to inflict a sharp wound.

The common water scorpion (*Nepa cinerea*) is a very frequent inhabitant of stagnant waters in our own country. It measures about an inch in length, and appears when the wings are closed entirely of a dull brown colour; but when the wings are expanded, the body appears of bright red colour above, with a black longitudinal band down the middle: the lower wings, which are of a fine transparent white, are decorated with red veins: from the tail proceeds a tubular bifid process or style nearly of the length of the body, and which appears single on a general view, the two valves of which it consists being generally applied close to each other throughout their whole length. The animal is of slow motion, and is often found creeping about the shallow parts of ponds, &c. In the month of May it deposits its eggs on the soft surface of the mud at the bottom of the water: they are of a singular shape, resembling some of the crowned seeds, with a coronet of seven bristles; and before they are deposited, these bristles closely embrace the egg next to them in the ovary like a sort of sheath, as if a chain of thistle seeds were formed by placing each in succession in the bosom of the down of the one next to it. As the mother insect deposits these eggs in the stems of aquatic plants, the bristles, which are partly left on the outside, are probably intended to prevent the aperture from being closed up, by the rapid growth of the plant. When the young are hatched, they are not more than an eighth of an inch in length. The larvæ and pupæ differ in appearance from the complete insect in having only the rudiments of wings, and being of a paler or yellower colour. The perfect insect breathes by means of a single pair of spiracles placed behind, the lateral spiracles being obsolete or rudimental. This insect flies only by night, when it wanders about the fields in the neighbourhood of its native waters in quest of prey.

Nepa linearis is an insect of a highly singular aspect, bearing a distant resemblance to some of the smaller insects of the genus Mantis and Phasma. It measures about an inch and a half from the tip of the snout to the beginning of the abdominal style or process, which is itself of equal length to the former part, and the whole animal is extremely slender in proportion to its length: the legs also are long and slender, and the fore-legs much longer in proportion than those of the second species, *N. cinerea:* the colour of the animal is dull yellowish brown, the back, when the wings are expanded, appearing of a brownish red, and the under wings white and transparent. It inhabits the larger stagnant waters, frequenting the shallower parts during the middle of the day, when it may be observed preying upon the smaller water insects, &c. Its motions are singular; it often strikes out all its legs at intervals with a kind of starting motion, and continues the exercise for a considerable time. Its eggs are smaller than those of *N. cinerea* of an oval shape, and furnished with two processes or bristles divaricating from the top of each.

According to Rösel the red eggs of a water-mite are deposited upon the bodies of the water scorpions; and, what is very remarkable, these eggs appear to increase in size during the process of hatching. De Geer remarked, that the water scorpions, when much infested with them, became gradually weakened as the eggs increased in size.



THERE's not a leaf within the bower;
  There's not a bird upon the tree;
There's not a dew-drop on the flower;
  But bears the impress, Lord! of Thee.

Thy hand the varied leaf designed,
  And gave the bird its thrilling tone;
Thy power the dew-drop's tints combined,
  Till like the diamond's blaze they shone.

Yes, dew-drops, leaves, and buds, and all,
  The smallest, like the greatest things;
The sea's vast space, the earth's wide ball,
  Alike proclaim Thee King of kings.—

MRS. OPIE.

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